

REMARKS

Claims 1 and 4-10 remain pending in this application. Claim 1 is independent. In light of the amendments and remarks made herein, Applicants respectfully request reconsideration and withdrawal of the outstanding rejections.

In the outstanding Official Action, the Examiner rejected claims 1, 4, 5, 8, and 10 under 35 U.S.C. § 102(e) as being anticipated by *Foster et al.* (USP 6,140,215); rejected claims 6-7 and 9 under 35 U.S.C. § 103(a) as being unpatentable over *Foster et al.*; rejected claims 1 and 4-8 under 35 U.S.C. § 102(e) as being anticipated by *Yamazaki et al.* (USP 5,932,302); and rejected claim 9 under 35 U.S.C. § 103(a) as being unpatentable over *Foster et al.* in view of *Yamazaki et al.* Applicants respectfully traverse these rejections.

By this Amendment, Applicants have amended claim 1 to more appropriately recite the present invention. It is respectfully submitted that this amendment is being made without conceding the propriety of the Examiner's rejections, but merely to timely advance prosecution of the present application.

Claim Rejections - 35 U.S.C. § 102(e) - *Foster et al.*

By this Amendment, Applicants have amended claim 1 to recite, *inter alia*, a plasma processing method comprising setting the plasma processing gas to a pressure P(Torr) where P(Torr) satisfies the following relationship

$$P_L(\text{Torr}) \leq P(\text{Torr}) \leq 3.5 \times P_L(\text{Torr})$$

wherein the plasma processing gas is a mixture gas of a reactant gas including gases selected from the group consisting of gases containing silicon atoms and halogen base gases with an inert gas, and the pressure $P_L(\text{Torr})$ is a higher pressure of either one represented by the following relationship

$$P_L(\text{Torr}) = 5 \times P_r(\text{Torr}) \text{ or}$$

$$P_L(\text{Torr}) = 2 \times 10^{-7} (\text{Torr}/\text{HZ}) \times f(\text{HZ}).$$

It is respectfully submitted that the disclosure set forth in *Foster et al.* is directed to a method and apparatus for low temperature deposition of CVD and PECVD films. Specifically, at col. 16, lines 14-19, *Foster et al.* teaches:

The change in deposition pressure from 1 Torr to 5 Torr produced a more stable and symmetric plasma. Additionally, the increased hydrogen flow with the addition of a small flow of argon increased the stability of the plasma flow as well as the plasma intensity.

In contrast, the present invention as set forth in claim 1 recognizes that a plasma processing rate decreases when too much inert gas is added, thus providing for a process for minimizing an amount of the inert gas to be added to the reactant gas within a range such that plasma can be kept stable in order to effectively achieve advances in plasma processing rate when the reactant gas is selected from the group consisting of gases containing silicon atoms and halogen base gases as recited in claim 1. There is no

teaching or suggestion in *Foster et al.* that is directed to this claim element. Additionally, there is no teaching or suggestion in *Foster et al.* that is directed to setting a variable partial pressure of a reactant gas $P_r(\text{Torr})$; setting the plasma processing gas to pressure $P(\text{Torr})$ where $P(\text{Torr})$ satisfies the following relationship

$$P_L(\text{Torr}) \leq P(\text{Torr}) \leq 3.5 \times P_L(\text{Torr})$$

wherein the plasma processing gas is a mixture gas of a reactant gas including gases selected from the group consisting of gases containing silicon atoms and halogen base gases with an inert gas, and the pressure $P_L(\text{Torr})$ is a higher pressure of either one represented by the following relationship

$$P_L(\text{Torr}) = 5 \times P_r(\text{Torr}) \text{ or}$$

$$P_L(\text{Torr}) = 2 \times 10^{-7} (\text{Torr}/\text{HZ}) \times f(\text{HZ}).$$

As *Foster et al.* fails to teach or suggest all of the claimed elements, it is respectfully submitted that *Foster et al.* fails to anticipate the present invention.

It is respectfully submitted that claims 4-10 are allowable for the reasons set forth above with regard to claim 1 at least based upon their dependency on claim 1.

Claim Rejections - 35 U.S.C. § 102 - *Yamazaki et al.*

It is respectfully submitted that the disclosure of *Yamazaki et al.* is directed to a method for fabricating with ultrasonic vibration a carbon coating. Specifically, *Yamazaki et al.* teaches

at col. 6, line 28 - col. 7, line 26 and Fig. 14 that the electron density rises as the pressure of an Ar gas rises and that the Ar gas pressure-electron temperature curve has a u-shape form that has a minimum value. However, there is no teaching or suggestion that provides for a plasma processing rate that decreases when too much inert gas is added as evidenced by the elements as recited in claim 1, namely,

$$P_L(\text{Torr}) \leq P(\text{Torr}) \leq 3.5 \times P_L(\text{Torr})$$

wherein the plasma processing gas is a mixture gas of a reactant gas including gases selected from the group consisting of gases containing silicon atoms and halogen base gases with an inert gas, and the pressure $P_L(\text{Torr})$ is a higher pressure of either one represented by the following relationship

$$P_L(\text{Torr}) = 5 \times P_r(\text{Torr}) \text{ or}$$

$$P_L(\text{Torr}) = 2 \times 10^{-7}(\text{Torr}/\text{HZ}) \times f(\text{HZ}).$$

As *Yamazaki et al.* fails to teach or suggest all of the claimed elements, it is respectfully submitted that *Yamazaki et al.* fails to anticipate present claim 1.

While, *arguendo*, *Foster et al.* and *Yamazaki et al.* provide for attaining a high plasma processing rate with a pressure according to one embodiment being the same as the pressure employed by the present invention, there is a risk that sufficient plasma processing rate cannot be attained if the frequency and partial pressure of reactant gas are different from those employed by the

present invention. As neither of the references cited by the Examiner teach or suggest all of the claimed elements, it is respectfully submitted that these claims are allowable over the art as cited.

Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Catherine M. Voisinet (Reg. No. 52,327) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.


If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By 

Terrell C. Birch, #19,382


TCB/CMV/jdm
0397-0404P

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

(Rev. 02/12/2004)